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On the supposed strange Variation in the Eggs of the Cuckoo. Being a Translation from the German of a Paper by Herr Baldamus.* By the Rev. ALFRED CHARLES SMITH, M.A.

IN following up my story of the colouring of the eggs of the cuckoo, as given in the 'Zoologist' for March (S. S. 1105), with a literal translation of Herr Baldamus' paper, I have but one object in view; and that is, to place before the ornithologists of England as prominently as possible what I conceive to be an extremely interesting theory, and which, once started by so eminent a naturalist as Herr Baldamus, and supported by so many proofs, deserves at all events very careful examination, before it is discarded as improbable and rejected as worthless.

I would here take an early opportunity of mentioning that the subject has received attention at the hands of Mr. George Dawson Rowley, who published an able article on "Certain Facts in the Economy of the Cuckoo," in the 'Ibis' for 1865 (new series, vol. i. pp. 178—186), but which had not appeared when I wrote my paper and read it before the Wiltshire Archæological and Natural History Society, of which I have the honour to be Secretary. Mr. Rowley, indeed, does not incline to agree with Herr Baldamus' theory, though, on the other hand, I have several notes, from various correspondents, confirmatory of the German ornithologist's view; and Mr. Rowley candidly says, "I cannot refrain from expressing my admiration at his researches, which of themselves bear witness to his reputation as an ornithologist:" and he continues, "the theory is as beautiful as it is new, and I only wish that fresh evidence may be brought forward of a nature so strong as to make it an acknowledged fact." Mr. Rowley also adds, "It would be much more satisfactory if English readers had the opportunity of studying Dr. Baldamus' article in their own language."

Fully agreeing with the sentiments thus expressed, while feeling wholly incompetent as yet to pronounce any opinion of my own on the question before us, I am glad, with the hearty concurrence of Mr. Newman, to offer the readers of the 'Zoologist' (which will, I suppose, include every ornithologist in England) as accurate a translation of the whole of Herr Baldamus' article as I could make; and I am especially glad to do so at this season, since the subject will be

* 'Naumannia' for 1853, pp. 307—326.

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fresh in the minds of my readers when the cuckoos arrive in April, and offer opportunities in May of testing the accuracy of Herr Baldamus' theory. Not, however, that such a question is to be settled in a day: it must, if it is to be fairly sifted, be tried by the concurrence of many investigators in various localities, and it can only be satisfactorily disposed of by the collection of a great many separate facts. For my own part, I am on the point of starting for the South, in order to avoid the cold winds of spring, as is my very frequent custom at this season; and before this paper is in the hands of my readers I hope to be in Portugal, whence I shall not return till the early part of June. I cannot therefore expect to be of much assistance personally in examining the eggs of the cuckoo this spring; but before I leave England I beg with all my heart to commend their very careful examination to my brother ornithologists at home, and I trust that when I return I shall find the pages of the 'Zoologist' well filled with information on the subject.

ALFRED CHARLES SMITH.

Yatesbury Rectory, Calne,
March 5, 1868.

Fresh Contributions to the History of the Propagation of the European Cuckoo (Cuculus canorus). By E. BALDAMUS.

THERE stands before me, in a small cabinet with many little compartments, a small collection of eggs. All around the work-table are lying almost as many similar eggs in small and large boxes. The half-instructed man would believe the whole to be a collection of a variety of songsters' eggs. I call up a lad who knows pretty well how to distinguish birds' eggs of the commoner sorts. "That is a lark's egg," he says; "that a garden warbler's (*Sylvia hortensis*), and this a wheatear's (*Saxicola œnanthe*)."

And if the matter had not been so positively ascertained; if Mr. Braune, the forester of Greiz, had not cut this large willow wren's (*S. hippolais*) egg (as it seems) out of the ovary of the cuckoo, which was killed as she was flying out of the willow wren's nest; if Count Rödern, of Breslau, was not a reliable authority, that this apparent redstart's egg was taken out of the nest of the redstart (*Ruticilla phœnicurus*); if Mr. Habicht had not taken this large tree pipit's egg out of the nest of a tree pipit (*Anthus arboreus*); if I myself had not taken out of the nests of the redbacked shrike (*Lanius collurio*) this reddish and this green grayish peculiarly marked cuckoo's egg;

one might indeed entertain doubts *whether this variously-coloured collection*—these green eggs, with and without markings; these on white, gray, green, greenish, brownish, yellowish, reddish and brown-reddish ground; these gray-green, olive-green, ash-gray, yellow-brown, olive-brown, yellow-red, wine-red, brown-red, dark brown and black; these spotted, streaked, speckled, grained and marbled eggs—*could one and all be the eggs of our cuckoo!*

And yet this is indeed the fact! Many of these eggs, evidently so widely differing, have long been known as cuckoo's eggs to our great ornithologists and oologists, such as Naumann, Thienemann, Brehm, Gloger, von Homeyer, Degland, &c. Every oologist knows that there are some, which, *both in colouring and marking, are extremely like* the eggs of the pied wagtail (*Motacilla alba*), the blackcap (*Sylvia atricapilla*), the whitethroat (*S. cinerea*), the reed wren (*Calamoherpe arundinacea*), the sky lark (*Alauda arvensis*), &c. "So much," says Thienemann, in his beautiful work on eggs above mentioned (p. 84), "*so much do many of these resemble the eggs of the wagtail, the tree pipit, the field lark and the great sedge warbler, that they can only be distinguished from them by the distinctive spots and the grain.*"

I shall return to these marks of distinction somewhat later; but now we are concerned, in the next place, to find authorities for the establishment of the fact, *that the cuckoo's eggs are in reality extremely similar to several other eggs—I mean the eggs of those birds in whose nests cuckoos' eggs are found;* however superfluous such references may seem to many an experienced oologist. Moreover, the Oology of our days has made much more extensive discoveries in these points.

A cuckoo, which instead of its ordinary more or less clear third tone, gave the second note of its cry in the fifth, with a shake on the fourth, appearing again in the following spring (1850) with the same remarkable cry, in the same isolated district, offered me an opportunity of investigating whether his species lived in monogamy, or in polygamy, or finally in polyandry. Accordingly I visited almost daily the district, which was very near me, but without attaining any positive result. I observed, however, only one female, which seemed to be paired with the above-mentioned male; while a male which inhabited a neighbouring district was driven away by the others as soon as it passed beyond its own limits. Still the above-mentioned male went frequently across a meadow to a little thicket, in which I never heard another male, but from which I obtained a cuckoo's egg: this, however, might certainly have been laid by the female of the first-mentioned district. In short, on this point I have been unable hitherto to arrive at any positive result. But two eggs of the same female, which I myself found on one day in that district, and which were coloured and marked just alike, both lying in nests of the whitethroat (*Sylvia cinerea*), one quite fresh, the other a little sat upon; these, coupled with a very differently coloured cuckoo's egg, which was found on the same day in another district, made me suppose *that at the root of this striking phenomenon there was a fixed law, perhaps a law which might be discovered.*

I now began to pay more attention to the cuckoo's eggs, and made it my special endeavour to make myself quite certain of every egg which passed through my hands, *with regard to the nests in which they were found;* and with that view and to that end I immediately wrote to my oological correspondents, to impart to them my opinions, and to invite them to a careful attention to these circumstances. In a short time I obtained the most astonishing results, part of which I communicated at Berlin and Altenburg,* and some of which have been already published in the 'Naumannia.' †

In the next place the list is now very much enlarged of those birds which are admitted to have acted as foster-parents of the cuckoo. Dr. Thienemann mentions the following:—

1.	Sylvia	hortensis	Garden Warbler.
2.	„	cinerea	Whitethroat.
3.	„	atricapilla ? . . .	Blackcap.
4.	„	curruca	Lesser Whitethroat.
5.	„	tithys	Black Redstart.
6.	„	phœnicurus . . .	Common Redstart.
7.	„	rubecula	Robin Redbreast.
8.	„	arundinacea . . .	Reed Wren.

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* When I communicated to a meeting at Altenburg my experience, further detailed in the text, the Royal Forester Braune, of Greiz, rose, very *à propos*, to support my previous assertions, by recording facts already touched upon above, and which will be more fully detailed further on—*viz.* that the cuckoo lays also reddish, dark-spotted eggs, very like the eggs of Hypolais. In Berlin the most distinguished anatomist and physiologist of our time, the Privy-Councillor Professor Johann Müller, challenged me to put together the cuckoo's eggs in the collection lying before me, and to mix them with the eggs of the foster-parents of the cuckoo which were lying near, and then to search again for the cuckoo's eggs, and to arrange them accurately, which I at once accomplished.

† 'Naumannia,' i. 2, p. 48, 51; ii. 1, p. 4; iii. 1, p. 105, 106; 2, p. 203, 228.

9.	Sylvia palustris	Marsh Warbler.
10.	„ cariceti	
11.	„ locustella	Grasshopper Warbler.
12.	„ trochilus	Willow Wren.
13.	Accentor modularis	Hedgesparrow.
14.	Troglodytes vulgaris	Wren.
15.	Saxicola rubetra	Whinchat.
16.	Motacilla alba	White Wagtail.
17.	„ flava	Gray Wagtail.
18.	Anthus campestris	Tawny Pipit.
19.	„ pratensis	Meadow Pipit.
20.	Alauda arvensis	Sky Lark.
21.	Emberiza citrinella	Yellowhammer.

In addition to these, the following may now be added:—

1.	Lanius collurio	Redbacked Shrike.
2.	Sylvia nisoria	Barred Warbler.
3.	Lusciola luscinia	Nightingale.
4.	Hypolais vulgaris	Chiffchaff.
5.	Phyllopneuste rufa	Rufous Warbler.
6.	Calamoherpe turdina.	
7.	„ phragmitis	Sedge Warbler.
8.	Regulus flavicapillus	Goldencrested Wren.
9.	Anthus arboreus	Tree Pipit.
10.	Alauda cristata	Crested Lark.
11.	„ arborea	Wood Lark.
12.	Emberiza miliaria	Common Bunting.
13.	„ schœniclus	Blackheaded Bunting.
14.	Loxia chloris	Greenfinch.
15.	Linota cannabina	Linnet.
16.	Saxicola stapazina	Russet Wheatear.

Subsequently there was added even a third list, and in this were several grain-eating songsters (*Conirostres*). Indeed it is not only possible, but most probable, that the number of foster-parents of the cuckoo will be found very much larger, especially by means of the African, Asiatic and South and North European species. Indeed Levaillant, even in his day, knew Lanius collaris and Backbakiri, Saxicola superciliaris and pastor, as those birds in whose nests the cuckoo laid her eggs, at the Cape. Moreover, the number of those kinds would have been found still greater, including nearly every species of the genera Lanius, Saxicola, Pratincola, Ruticilla, Lusciola, Sylvia, Phyllopneuste, Hypolais, Calamoherpe, Calamodyta, Accentor, Regulus, Motacilla, Budytes, Anthus, Alauda, Emberiza, and even Fringilla: all these would have been known as foster-parents of the cuckoo, if we had recognized *as such* all those *cuckoos' eggs* which had been found in their nests, especially those *of peculiar colouring.**

When Dr. Thienemann wrote his description he had before him twenty-five specimens from different countries of Europe. Of these the colouring changes from simple white to a yellowish, grayish or greenish tinge. Those with a white ground are sparingly spotted: the under markings are ash-gray; then follow gray or greenish brown dots, little specks or compound points, upon these light or dark and generally circular spots, with the edges frequently shaded down.

Those single spots, which sharply contrast with the ground colour, are in the greater number of the eggs extremely characteristic, and only in very rare cases are they entirely wanting. Those with darker ground colour generally have the spots in three distinct shades of the ground colour. In many cases they are indistinct, but very thickly distributed over the whole space, sometimes thicker at the larger end, where they occasionally form an indistinct zone.

I have now lying before me more than sixty specimens of my own collection, and more than half as many more, which have been forwarded to me by the kindness of the Counts Rödern, Schallehne, Vogel and others. The collections of these and of the Messieurs Kunz, Passler, Habicht, Hoffmann and Pralle contain about a hundred specimens. Thus I have ample materials before me.

These eggs † are taken out of the nests of the following Insessores, and accord in colouring and marking with the eggs of the birds in whose nests they were found:—

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* Certainly I can assert nothing positive of my own knowledge, although it is by no means improbable that Muscicapa also and Sturnus belong to the above list. The striking fact that even the corn-eating warblers bring up cuckoos is established beyond all question (S. Naumannia, a. d. a. O), and is thus explained—that the latter feed their young, at any rate at first, with insects.

† In addition to these there are about twenty specimens, chiefly of a gray-green and whitish colouring (Nos. 6, 11, 16 and 20) from unknown localities.

	No. of specimens.	Other colouring. (Exceptions.)
1. Lanius collurio (Redbacked Shrike)	3	
2. Ruticilla phœnicurus (Redstart)	4	
3. Rubecula familiaris (Redbreast)	3	2 specimens with colouring of No. 6.
4. Lusciola luscinia (Nightingale)		1 specimen „ 6.
5. Sylvia nisoria (Barred Warbler)	1	
6. „ cinerea (Whitethroat)	6	1 „ „ 16.
7. „ hortensis (Garden Warbler)	4	
8. „ atricapilla (Blackcap)	1	1 „ „ 6.
9. Hypolais vulgaris (Chiffchaff)	1	1 „ „ 16.
10. Calamoherpe turdina (Great Sedge Warbler)	2	1 „ „ 11.
11. „ arundinacea (Reed Wren)	8	1 „ „ 20.
12. „ palustris (Marsh Warbler)	2	1 „ „ 8.
13. „ phragmitis (Sedge Warbler)	1	
14. „ aquatica (Aquatic Warbler)	1	
15. Accentor modularis (Hedgesparrow)	1	
16. Motacilla alba (Pied Wagtail)	7	1 „ „ 11.
17. Budytes flava (Yellow Wagtail)	2	
18. Anthus arboreus (Tree Pipit)	4	1 „ „ 6.
19. „ pratensis (Meadow Pipit)	1	
20. Alauda arvensis (Sky Lark)	4	
21. „ cristata (Crested Lark)	1	
22. „ nemorosa (Wood Lark)	1	
23. Emberiza citrinella (Yellowhammer)	1	
24. Linota cannabina (Linnet)	1	1 „ „ 16.
25. Saxicola stapazina (Russet Wheatear)	1	in the collection of M. Gerbe, of Paris.
26. Ruticilla tithys (Black Redstart)	1	„ Dr. Dehne.
27. Emberiza miliaria (Common Bunting)	1	„ Olph. Galliard.
28. Loxia chloris (Greenfinch)	1	„ Pralle.

No. 1 contains two specimens of a yellow-red ground colour, with reddish gray under spots and yellowish red upper spots. The eggs of the shrike, in whose nests I myself found both of these, belonged to the reddish variety: in all probability they were laid by an old hen. The third specimen was found in a nest of this bird, which contained eggs of a greenish ground colour, with olive-gray and olive-brown markings, which it resembled both in colouring and in markings.

2. These four specimens, which were found in the nests of Ruticilla phœnicurus are all of a light green ground colour: two of them have

at the larger end more or less brownish red spots,* which on one of them form a zone; the third has similar markings, but only sparingly scattered over the whole surface; whilst the fourth (which, together with many others of undoubted authenticity, was sent me by the obliging kindness of Count Rodern) is without any marking at all: herein it is identical with one in the possession of Dr. Dehne (Naum. iii. 2, p. 203), which is uniformly light greenish blue, without any markings whatsoever.†

3. Three which were found in the nests of Rubecula have exactly the same yellowish white ground and brownish cinnamon markings as the eggs of the redbreast, only that they are somewhat more distinct and more determined, while the spots are larger and extend over the whole surface, but are very sparingly distributed in comparison with the eggs of the redbreast; still there are varieties of these latter which very nearly resemble these cuckoo's eggs.

4. A cuckoo's egg, which I myself this year took out of the nest of Lusciola luscinia,‡ can only be distinguished by its size and grain [" das korn"] from the three eggs of the nightingale which were lying in the nest with it: I saw the hen cuckoo at different times near this nest, and I took her egg as soon as it was laid. To my regret two neighbouring nests of the nightingale, which this hen cuckoo also visited, were destroyed, perhaps by herself (might it not be because the clutch § brooded on was in too forward a state to suit her later eggs?), and so I found no other eggs in this district of Diebziger Thicket, although it had been especially rich in nightingales.

5. The six cuckoo's eggs which were found in the nests of Sylvia cinerea, and which resemble in some cases the lighter, in others the darker varieties of the eggs of that bird, are of a dirtyish light or darker greenish white colour, thinly or thickly marked with under spots of ash-gray and upper spots of a dirty olive-green.

7. The nest of Sylvia hortensis furnished me with four cuckoo's eggs, one of which I received through the courtesy of Count Rödern: they are of a dirty yellow-white ground colour, with under spots

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* There occur also eggs of Ruticilla phœnicurus and Saxicola œnanthe with similar markings.

† M. Gerbe, in Paris, has a third plain cuckoo's egg, without spots, of an uniform verdigris-green colour, taken from a nest of Saxicola stapazina. It appears that all the chats should be added to swell the number of the rearers of the cuckoo.

‡ By mistake Sylvia nisoria is put in the text for this bird.

§ " Die Brüt." We have no word exactly answering to this.

of yellow-gray, and upper markings of a light and dark olive-brown.

8. One cuckoo's egg was, without doubt, found in a nest of Sylvia atricapilla, which resembled the eggs of that bird, even to the so-called "marks of branding" ["brandflecken"]. I myself found it close to the White Morass in the Banat, South Hungary.

9. As regards the egg mentioned above, which came from the nest of Hypolais, the following circumstance occurred:—Mr. Braune, the Royal Forester, for a long time observed a hen cuckoo flying to a nest of the chiffchaff, of which he knew the locality, and which already contained several eggs. Fearing lest the nest built by this superb songster, in his garden, might be destroyed by these visits, he on that account shot the cuckoo, in whose ovary ["legedarm"] he found a perfectly formed egg, which, to his great surprise, was coloured exactly like the eggs of Hypolais, and when he came to examine the nest closely he found a similar egg already laid in it.

10. Two eggs from the nests of Calamoherpe turdina (especially that one which belongs to Count Rödern) show, even in their faded condition, the peculiar olive-green ground colour of the eggs of the great sedge warbler, which for depth of colour are only surpassed by two cuckoo's eggs, taken the one from the nest of Accentor modularis and the other from the nest of Calamoherpe palustris. Less striking is the similarity in regard to the marking.

11. Eight eggs out of the nests of Calamoherpe arundinacea. [Perhaps these are the warblers which, next to Sylvia cinerea and Motacilla alba, bring up the greatest number of cuckoos.] These eggs remind one, both in colour and marking, of the eggs of this bird. Indeed by far the greatest number of cuckoo's eggs which I have seen resembled the eggs of S. cinerea and C. arundinacea, which are so like one another.

12. We have just mentioned one of the two cuckoo's eggs which were found in the nest of Calamoherpe palustris, which is of a tolerably deep blue-green or verdigris-green ["spahngrüner"] colour: it has the characteristic spots, as if of branding, and the deeper as well as the surface markings of the marsh warbler's ["sumpfrohrsängereier"] egg: I found it myself at the White Morass in Hungary. The other, which is in the collection of Count Rödern, is of a pale ground colour, and moreover has the characteristic markings, though more indistinct and thickly spread over the whole surface. One very

like the Hungarian specimen was found by the Pastor Passler in a marsh warbler's nest (Naum. i. 2, p. 49).

13 and 14. One found by myself in the nest of Calamoherpe phragmitis, and one found by Count Rödern in the nest of C. aquatica, show the extremely faint markings which almost hide the real ground colour of these sedge warbler's [" rohrsängereier "] eggs.

15. One of the most interesting of the cuckoo's eggs is a beautiful blue-green one, which was taken out of the nest of Accentor modularis, without any markings, and which, *even to the shell, the grain and the size* [" bis auf schale, korn und grösse"], is like a very dark egg of the hedgesparrow.

16. The nests of the pied wagtail furnished me with seven cuckoo's eggs, all of which (but especially the specimen belonging to Count Rödern*) more or less resemble the eggs of the wagtails, in their white or greenish ground colour, as well as in their gray and blackish streaked markings.

17. The same may be said of one found in the nest of Budytes flava.

18. Amongst the most interesting, both in regard to colouring and marking, are the three (or perhaps four, for the exact nest from which one was taken is uncertain) which were found in the nests of the tree pipit: one is even now, after the lapse of several years, of a dull wine-red colour, which is very deep [" sehr intensiv "], and shades off very unmistakably into violet. The violet and reddish brown markings show clearly the characteristic measle-like [" gleichsam maser "] speckles, blotches and burning marks, which belong to most of the tree pipit's [" baumpiepereier "] eggs. Two others bear the same character of markings in bluish gray and reddish gray upon a light blue-gray and light violet-gray ground.

19. One found in a meadow pipit's [" wiesenpieper"] nest shows the faint streaky markings of this pipit's eggs in a gray, which in slight shades approaches to yellow.

20, 21 and 22. These have in several shades, both of the ground colour and of the markings, just the peculiarity of marking belonging to the lark's eggs [" lerchen eier"], *viz.* a dirty greenish or yellowish gray, with faint and indistinct marbled streaks and spots.

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* I must here observe that the Count Rödern assured me that he had himself taken from the nests the whole of the cuckoo's eggs handed over for my use, except the plain green egg which a collector in Breslau took from a [" rothschwanz "] redstart's nest.

23. The eggs from the nest of Emberiza citrinella has just the same hair-streaks, or (as Dr. von Middendorf calls them) "vermiform lines" ["wurmlinien"] of the bunting's ["ammereier"] eggs; whilst—

24. The egg which was found in the nest of Linota cannabina has a light-green ground colour, with a few reddish brown spots.

This is the description of the cuckoo's eggs now lying before me, which resemble the eggs of the foster-parents. But there must be added to the list—

26. One which was described by Dr. Dehne (Naum. iii. 2, p. 203) which was laid in a cage by a cuckoo that was caught in a hay-loft, and which was very probably destined for a nest of Ruticilla tithys, though R. phœnicurus also sometimes builds its nest on and in buildings. The light-greenish blue egg, without any markings, might have passed for the egg of either species of the redstarts ["rothschwanzarten"]; for those also belonging to R. tithys—that is to say, of certain pairs—are sometimes of a greenish-white colour.

27. Herr Leon Olph. Galliard describes a cuckoo's egg which he had taken out of a nest of Emberiza miliaria, as very similar to the eggs of that bird. I even conjecture that the supposed bunting's egg ["ammerei"], which this excellent observer found in the œsophagus of a cuckoo which he had killed, was the egg belonging to the bird killed by him, and which she had thus in her beak in order to carry it in this manner to a nest which otherwise would have been inaccessible to her.* (S. Naum. iii. 1, p. 106.)

28. The cuckoo's egg which was found in the nest of Loxia chloris, together with other eggs of that bird, by Herr Pralle, Secretary at the

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* It does not at all tell against this view that the dead bird had the egg in her œsophagus, for in her fright she had swallowed it. That the cuckoo avails itself of its beak to place its eggs in many nests is *a priori* established, for there are cases in which no other means are at all possible; besides many a hen cuckoo has been killed which had its own egg in its mouth. But in just such a case the whole proceeding has been lately and accurately watched. A charcoal-burner in the Forest of Thüringer had built his somewhat low forest-hut in sloping ground, when a cuckoo (which he had long observed flying about in the neighbourhood) flew into the hut, perched upon a bench near the entrance, laid an egg, seized it in her beak, and placed it in a wren's ["zaunkönig's"] nest, which was built against the inner side of the hut. The man, who knew nothing of the history of the propagation of the cuckoo, gazed on in silence, and full of astonishment at what was happening before his very eyes, and afterwards related the "wonder" to Herr Mädel, an actuary in Gotha, to whom I am indebted for this very interesting communication.

Post Office, was not very observable from the others in regard to its ground colour, *even when it was faded* [" selbst wenn es verbleicht war"], so that one would point it out from its striking dissimilarity.

Moreover, we should lay the less stress upon such a dissimilarity, as the grain-eating warblers are only in very rare cases chosen as the foster-parents of the cuckoo, which is appointed to eat animal food. Herr Olph. Galliard indeed maintains that the cuckoo, at least in his locality (the environs of Lyon), has a preference for the nest of the common bunting [" grauammer"], and has himself taken several young cuckoos which had been brought up in the nests of these birds: and Herr Bethe (S. Naum. iii. 1, p. 105) found in the stomach of one taken out of a linnet's nest quite green unripe *seeds* (Panicurus sanguinale and others). But even on the supposition that buntings and finches [" ammern und finken"] do not feed their young ones *entirely* with vegetables, the fact last mentioned shows that the bringing up of a bird which is appointed exclusively for animal food, by those which *only*, or at any rate *partly*, feed on vegetables, must belong *to the exceptions;* and it is a question whether the cuckoo which had been taken out of the linnet's nest by Herr Bethe would not have died if the linnets had continued to feed it with the seeds.*

For that reason it would be quite extraordinary if the cuckoo's eggs should resemble the eggs of these exceptional foster-parents.

The *fact* is quite established, and beyond all doubt, *that there are cuckoo's eggs which, both in colour and in markings, are very like the eggs of those warblers in whose nests they are accustomed to be laid.*

What follows then from this?

If Nature has any motive in this, and she never trifles, there is, in unison with the high dignity of the laws of Nature and the Creator, a conclusion very apparent: *she has so planned her arrangements as to facilitate the continuance of the species under the conditions once appointed.* This seems more sound than the assumption that she had a desire to show that warblers (which generally recognise so easily all strange eggs, casting them out of the nest, or else deserting it), in regard to the cuckoo's eggs, are quite blind, and cannot recognise the red eggs amongst their green layings (clutches),* and *vice versâ.*

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* There certainly remains still the possibility that instinct may lead the foster-parents, out of the order of corn-eating warblers, to continue to bring insects again and again to the young foster-bird, which showed signs of hunger, and yet declined seeds of various kinds. It would indeed be extremely interesting if the stomach of a cuckoo like this of Herr Bethe should come into the hands of a Johann Müller.

No other motive seems probable, and the choice between the two above mentioned does not seem to me to be difficult.

Therefore I do not hesitate to set forth, as a law of Nature, that *the eggs of the cuckoo are, in a very considerable degree, coloured and marked like the eggs of those birds in whose nests they are about to be laid, in order that they might the less easily be recognised† by the foster-parents as substituted ones.* ‡

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* "Gelege." "Loiters," as we say in Wiltshire.

† It must, however, by no means be asserted that in carrying out this object Nature cannot and does not employ other means as well.

‡ It is not without great significance for us that this rule has reference (as it appears) to almost all the species of the true cuckoo.

1. Cuculus flavus, *Gm.*, according to Thienemann (l. c. p. 85) has reddish gray-white or reddish yellow-gray eggs, with some, scarcely visible, very fine ash-gray or reddish gray dots and specks, massed together at the larger end, in the form of a wreath, and comparatively scattered over the remaining surface. These were found by Boie and Macklot in the nests of Enicurus coronatus, *Tem.*, and Megalurus palustris, *Horsf.*, which have eggs partly similar.

2. C. cineraceus, *Vig.* and *Horsf.*, lays eggs of a dirty reddish white, more inclining to gray or yellow, almost without spots: they were found by Dr. Preiss in the nests of Meliphaga fulvifrons, and by Gould in those of Rhipidura motacilloides. Upon these Dr. Thienemann makes the observation, "It is worthy of remark that the eggs of many New Holland birds also, especially of the division of Meliphaga, have a reddish ground."

3. The eggs of C. solitarius, *Cuv.* (according to Levaillant), are reddish white, powdered with light brown specks, and consequently extremely like the eggs of Saxicola superciliaris, Malurus macrourus, Sylvia coryphea and Turdus reclamator.

4. C. serratus, *Sparrm.*, edolius, *Cuv.* (likewise according to Levaillant), lays its clear white eggs in the nests of Motacilla capensis, Malurus subflavus, and other small insectivoroos birds.

5. C. niger, *L.* (according to the statement of General Hardwicke), lays its eggs, which are rather large and of a greenish gray-white, evenly covered with very fine grayish brown and yellow-brown specks, in crows' nests. They have, moreover, a great resemblance to the eggs of many of the crows.

6. C. lucidus, *Lath.* Inasmuch as Acanthiza diensensis and chrysorhœa, Glyciphila fulvifrons, Malurus cyaneus and others of this genus, and Petroica multicolor, are known as foster-parents of this bird, so a fair number of its eggs varies as regards their colouring and marking, exactly in the same manner as with the eggs of our cuckoo. One finds the ground white and speckled with red and reddish brown in a variety of shades, mostly with numerous delicate spots, which collect near the larger end, and often form a distinct wreath; or with large confused specks, oftentimes heaped on one another, as is the case with many species of fowls. Then again there

That is the *rule*, which (like all other rules) will not be without *exceptions*.

But before we proceed to discuss and explain it, there is another inquiry, which, if not fully answered, should at any rate be stated.

The question then is, *does the same hen cuckoo lay eggs of the same colour and markings only?* and so *is she limited to the nests of but one species?*

Or else, *does the same individual lay eggs of different colour and marking, according to the character of the eggs amongst which her own will be intruded?* My friend H. Kunz (to whom I first communicated my observations on the difference of colour in the eggs of the cuckoo, and who also made similar observations) pronounced his opinion in favour of the latter view, and advanced the following hypotheses (Naum. i. 2, p. 51):—"The sight of the eggs lying in the nest has such an influence on the hen which is just about to lay, that the egg which is ready to be laid assumes the colour and markings of those before her." Such an event is in itself by no means improbable. There could be adduced for it reasons and analogies from Physiology. First, in one of the oldest records of history, *viz.* in the Pentateuch* there is a relation of ancient experience, that sudden, extraordinary and particularly strong or lasting impressions upon the senses (particularly on the sense of sight) of the mother during the conception

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occur eggs entirely olive-green or olive-brown, which in colour resemble the eggs of the nightingale, where, however, the larger end is of a darker, the smaller of a somewhat lighter, colour, as is the case with many eggs of the birds of New Holland.

7. C. auratus, *Gm.*, lays eggs of a shining white. Levaillant affirms that it lays its eggs in the nests of the smallest insect-eaters; and since he shot a hen bird which had its own egg in its mouth, and thereupon he drew the conclusions that the bird introduces its eggs by means of its beak into nests which it cannot enter, it is right to accept this; and the clear shining white of the eggs supports this assumption, that it prefers to entrust its eggs to those species which breed in holes. Perhaps even the allied species (Indicator major and minor), which lay white eggs in holes of trees, belong to its foster-parents.

Whether therefore, finally (Journal f. Ornithol. i. 2, p. 144), Cuculus glandarius, since it does not personally incubate its own eggs, can no longer remain as a type of Swainson's order Oxylophus, is of no importance to this question; but it is of importance that the eggs of this parasite, too (whether it be a genuine cuckoo or not), are so wonderfully like the eggs of the foster-parents that one can scarcely distinguish them, in colouring and marking, from many small specimens of the crow's eggs at least that is the case with my own specimen, which I received from Herr A. Brehm.

* Genesis xxx. 37 and following verses.

and first stages of pregnancy, may under certain circumstances have a considerable influence on the formation of the embryo. So it would not be of itself improbable that Nature would follow out in this manner her design once advanced.

Nevertheless, several facts speak against this explanation. In the first place, experience, which proves that the eggs of the cuckoo are differently coloured and marked, according to the localities, or (as Temminck says) "they depend upon the locality." * This fact, even under the limitation pointed out in the note, would not be enough to explain if one would set out from the view put forth in the text, since

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* It is evident that this assertion of Temminck's must be modified, in that it strictly appertains to certain, but by no means to all, localities; that is to say, in those spots where certain cuckoos' foster-parents live near one another in remarkable abundance, while there are not many other warblers in the neighbourhood, the cuckoo's eggs will assume entirely the type of the eggs of the predominating species. Such spots are, for instance, large reed-ponds, where Calamoherpe arundinacea, by far the most abundant breeder among the warblers, is wont to dwell: and in fact this assumption will be confirmed in a surprising manner by the knowledge, derived from experience, that almost all the cuckoo's eggs from the Badetzer pond near Zerbot, where the cuckoo is very abundant and the reed warbler ["teichrohrsänger"] is the most common bird, assume the type of the last-named bird's eggs. Moreover, in the vicinity of streams and brooks, in grass-flats, willow-beds and tracts of wood, where Motacilla alba finds its favourite haunts; in marshy meadows and moors, where Anthus pratensis breeds in the greatest abundance (as in all probability in the neighbourhood of Leyden, and in the immediate environs of Herr von Homeyer, who, in his 'Systematic Review of the Birds of Pomerania,' p. 10, alleges that the cuckoo lays its eggs principally in the nests of the ["weissen bachstelge"] pied wagtail and the ["wiesenpieper"] meadow pipit); lastly, in districts where Emberiza miliaria is particularly abundant (as is apparently the case in the neighbourhood of Lyons); throughout all these places will the cuckoo's eggs assume various predominant colours, according to the various localities. In opposition to this view of Temminck, M. Mogirin-Tandon (Degland, Ornith. Europ. i. p. 170) asserts "that the variation of the cuckoo's eggs depends upon age, state of health, vigour in laying ('abondance de la ponte'), and the kind of food." Of all the explanations of the fact that is the one which has the least to say for itself, so much influence one is inclined to allow to the arguments above mentioned for the origin of other varieties of eggs. Dr. Gloger (Handb. d. N. G. der Vögel Europa's, i. p. 448) supposes that generally, but certainly not invariably, nearly all the cuckoo's eggs laid in the course of one year, and by various hens, at least such as happen to be laid at the same time, are very similar to one another; and then adds, thereupon, this appearance may be readily explained by the general use of this or that sort of food in the course of one or another year, since in most summers just this or that sort of caterpillar appears in a neighbourhood in peculiar abundance, and for some time generally presents itself to the hen cuckoos in that place in great numbers.

always some nests of other birds, besides the predominating species, would by their eggs have a great influence over the colouring of the cuckoo's eggs.

But how then could it be explained *that two cuckoo's eggs of entirely different colour and marking can occur in one and the same nest?* and yet this fact also has been repeatedly established. I myself found in a nest of Calamoherpe arundinacea, which was placed in a ditch sparingly overgrown with weeds, two cuckoo's eggs, together with three eggs of the above-named bird. Of these cuckoo's eggs one had the type of C. arundinacea, and the other had the type of the eggs of Sylvia hortensis. Two other cuckoo's eggs are lying before me, taken from the nest of a warbler [" grasmücke"], very probably of S. cinerea, of which one has the character of the egg of that bird, the other of the eggs of S. atricapilla. That the two first could not have been laid by the same hen (which, moreover, if it was so would not have removed the difficulties before us) is proved by the precisely similar state of advancement towards hatching in both of them [" bewies das gleiche stadium der bebrütung beider"]. Thus they must have been laid by two hens;* but whichever of the two was laid first, and even if the one bearing the type of the whitethroat's egg was laid in the nest while it was yet empty, the difficulty of explaining the colouring of one or the other, according to the theory of Herr Kunz, still remains undiminished.

Moreover, *cuckoo's eggs are found*, although rarely, *in such nests as have not yet received any eggs of the owner;* in which case the cuckoo is without any pattern of a fixed form of colour for its egg.

Finally, a direct proof, and quite an independent one, against this theory, is furnished by experience, *that one and the same hen cuckoo lays similarly coloured eggs in the nests of different species.* However important, on one side, is the proof furnished to us by Herr Braune, the forester, that both eggs of the cuckoo he described had the colouring of the eggs of Hypolais, in whose nest the one was laid, it would have been more important if one could have observed in what nest the second egg (which was cut out of the bird) would have been laid. Meanwhile the following fact will support what has been said. As I observed already at the beginning of this paper, I found on the same day two cuckoo's eggs, coloured exactly alike, of the type of the eggs of Sylvia cinerea, in two nests of that bird, in the district of that pair, the cock bird of which attracted my whole attention by his peculiar cry. Both eggs undoubtedly belonged to the same hen bird. After about eight or nine days, a boy, whom I had commissioned to search for nests in the district which I pointed out, brought me a third egg, exactly similar, together with the nest and eggs of S. hortensis: all three eggs are in my collection, and are not to be distinguished from one another. We may with confidence assert that this third egg also belongs to the same hen, or rather pair, in whose district the boy had found it.

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* Naumann, Thienemann, Degland and others assert that sometimes two cuckoo's eggs have been found in one nest, and nearly all those authors add thereupon that they were in all probability laid by two different hen birds, and this without taking into account the colouring of these eggs.

Thus all experience *hitherto made* declares for the assertion *that every hen cuckoo lays only eggs of one colouring, and consequently* (as a general rule) *lays only in the nests of one species.*

"All experience hitherto made," I say, including even the *exceptions* to the rule. Yes, indeed, for it is just here that these find the only satisfactory explanation. We repeat once more, so striking an appearance of the cuckoo's eggs, agreeing with the very various colouring of the warbler's eggs, cannot be accidental or without purpose. Moreover, it is easy enough to see the purpose which Nature has in view herein. Most certainly, too, does she attain that purpose, by securing and facilitating the continuance of the species, through the circumstances, once and for some good reasons firmly established, which forbid the cuckoo to hatch and rear her own young. She attains this purpose in the way above mentioned, perhaps also by some other means. In short, we think the case to be this: every pair, or rather each individual cuckoo, is endowed with the instinct to lay its eggs in the nests of some one species of birds which are fit to act the part of foster-parents; so in order that these latter may the less readily observe the strange egg it is found to be of similar colouring to their own; and perhaps for the same reasons it is also so disproportionably small. Then every pair of cuckoos seeks its old district, or that spot where it breeds, just as all other birds do. Here (as a general rule) it finds those species of warblers which it requires for its peculiar circumstances, but certainly not always in the necessary numbers, or perhaps breeding earlier or later than its six to eight weeks' time for laying ["legezeit"] lasts. It will therefore be unable to find for each of its eggs a fitting nest of that species to which it was prepared to entrust it, and to which it was used, and so it finds itself obliged to introduce one and another egg into the nests of some other warblers, if haply by good chance it can do so.

Thus then it comes to pass that there are, and according to the nature of circumstances there must be, *proportionably many exceptions* of the rule.

Thus, too, it comes to pass that *by far the greatest number of cuckoo's eggs* bear the type of the eggs of Calamoherpe arundinacea, Sylvia cinerea, Motacilla alba (and perhaps, in certain other localities, of Anthus pratensis, Emberiza miliaria, and others), and that on that account eggs *of such colour form the most frequent exceptions;* that is to say, are the most frequently found in the nests of other species.

Since then, as has already been observed, just those species, even in all parts, but more especially in suitable localities, are rich in individuals, and live very near together, and thus, either occasionally or always, offer a favourable opportunity for the hatching of the cuckoo's eggs; so, on the one hand, the motive for the local prevailing colour is evident; on the other hand, the frequent occurrence of such colouring in other nests is accounted for; the latter, inasmuch as some birds (Calamoherpe arundinacea, for example), on account of their late period of breeding, can hardly ever receive the first eggs of the cuckoo, which are laid towards the beginning of May.* On the contrary, the *rarer colourings will appear as exceptions still more rarely,* although the birds for whose nests they are designed breed less abundantly, and so their nests are more difficult to be found by the cuckoo; but it appears that, on this account, so much the more determined is she in seeking for such nests, and she searches so as to find and to make use of them, as, for example, those of the redstart ["rothschwanz"] and the wren ["zaunkönig"], even on the hayrick and in the charcoal-burner's hut, quite renouncing her usual timidity. Does her instinct possibly tell her that eggs of such striking contrast are in especial jeopardy? Besides these very circumstances seem in general to require larger districts for those kinds of pairs, and at the same time to require and account for the frequent excursions of the hen bird in the neighbouring districts, in her search for those particular nests which in her own district do not exist in sufficient numbers.*

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* But how much the more true is this in regard to nearly all the others. I would investigate all, in order, if possible, to prove these views by means of more numerous facts. The Badetzer pond, already mentioned, offers abundant opportunities to this end. Many observers may have similar opportunities: let them, on all sides, be taken advantage of.

Thus, lastly, it comes to pass that *the two prevailing colours* of the cuckoo's eggs are spread over *most localities*, whilst at the same time they also appear *almost everywhere*, as exceptions, in other nests. They are those of Sylvia cinerea and Motacilla alba. The diffusion of these birds is very extensive, and their dwelling-places for the most part offer to the cuckoo also the requirements of its existence. It is therefore not without signification that one seldom finds in their nests cuckoo's eggs of other colours, but one does frequently find in the nests of other birds cuckoo's eggs of their type.†

It is asserted that numbers convince. Let any one then look once more at the catalogue of the cuckoo's eggs which are lying before me, and he will find that notwithstanding by far the greater part of them are only from this country, which certainly is a very rich locality, still they do not contradict the views explained above.

In conclusion, let us separate that which is matter of fact, and confirmed by experience, from the deductions derived therefrom: thus it is proved by facts, that—

(1). The cuckoo entrusts its eggs to a great number of species of warblers to be hatched by them.

(2). Cuckoo's eggs occur of a great variety of colours and markings, such as does not happen in the case of any bird (so far at least as is known up to this time).

(3). All, including the most varied colourings of its eggs, find analogous eggs amongst those of its foster-parents, similarly coloured and marked, so that they might easily be mistaken for them.

(4). Certain particular colourings appear to predominate in different localities.

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* Perhaps they are such hens, of which Herr S. Prevost in general asserts, "As soon as they have paired, have laid an egg, and made themselves certain of its reception on the part of the chosen foster-parents, they desert their first mate to search for another, which they then likewise forsake as they have forsaken the first. According to his account only the males have a fixed station. It would be important to learn in what localities he had made these observations. (Degland, Orn. Europ. i. p. 169.)

† With regard to these circumstances I was able to assert at Halberstadt (Naum. iii. 2, p. 121) that so rash a conclusion from the exceptions produced by Herr J. Hoffman has no authority, and that even those exceptions are in support of my views. They were almost all of the colours above pointed out, and had been laid in the nests of Rubecula, Hypolais, Phyllopneuste and Linota cannabina! (Naum. i. c. p. 15.)

(5). Each hen bird lays but one egg in each nest.

(6). She lays, as a general rule, only in those nests in which she finds eggs of the foster-birds already laid.

(7). The same hen bird lays eggs of similar colouring, as a general rule, in the nests of the same species only.

(8). The exceptions to 4, 5, 6, 7 are comparatively rare.

(9). Most of the warblers forsake their nests readily and at the smallest interruption.

(10). They pursue and drive away the cuckoo whenever it comes into their neighbourhood.

(11). The latter takes advantage of the absence of the parents to lay its egg in their nest.

(12). She lays her egg on the ground, and carries it in her beak to nests not otherwise accessible, and she even does so when she has the opportunity of laying it in nests perfectly accessible.

(13). With that end in view, she even lays aside her customary shyness of buildings.

(14). One may occasionally find two cuckoo's eggs of different colours in the same nest.

We conclude from these facts, that—

(1). Nature must have a special motive in these so many circumstances thus connected with one another, but so peculiar.

(2). This motive is plainly to be seen. She will, by means of arrangements originally made by her, ensure and facilitate the preservation of a species otherwise much exposed to danger.

(3). She attains this motive by a very simple method, in that she invests every hen bird with the faculty of laying eggs coloured exactly like the eggs of the bird of whose nest she prefers to make use, according to the locality;* or, in other words, every hen cuckoo lays eggs only of a fixed colour, corresponding (as a general rule) with the eggs of that warbler in whose nest she lays them, and she only lays in other nests when, at her time for laying ["legereife"], one of the species of her own peculiar type, as we may say, is not ready.

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* One cannot here make the objection, that so nothing at all is attained: if the foster-mother has only accepted the first, and sat upon the strange egg, then the instinct of becoming foster-parents, so preeminently strong in birds, will provide for the further breeding up of the young.

E. BALDAMUS.

After the above paper had been concluded, I received further information from that excellent observer, Mr. Inspector R. Tobias, of Leipzig. I hasten to add it as belonging to this place.

"Although I, too, have found continually that the eggs of our cuckoo are like the eggs of that bird into whose nest each intrudes its egg (for I found in the nests of the reed wrens ["rohrsänger"] greenish, in those of the tree pipits ["baumpieper"] reddish, and in those of the whitethroats ["grasmücker"] whitish and greenish eggs); still I am not of opinion that each hen lays eggs of always the same colour, but in the course of the summer lays eggs of very different colours, according to the eggs of the nest which she uses. The following fact will prove it:—In a small pond, sparingly overgrown with reeds (Phragmitis communis), I found a nest of Calamoherpe turdina, in which, close to the very vividly coloured eggs of the warbler, was a cuckoo's egg of a ground colour of so deep a green that till then no other like it had ever occurred to me. But, within a circuit of half a mile, no other pond existed in which a reed wren (neither C. turdina nor yet C. arundinacea) was breeding, while the cuckoos, on the contrary, were more numerous, so that in the above-mentioned district at least three pairs had their abode: under these circumstances the hen cuckoo which laid the egg described was obliged to be content with the nest of some other species of warbler, and therefore in all probability to lay eggs of quite a different colour. The following fact seems to speak still more plainly in favour of this view:—In the year 1842, on a certain estate, there were made, out of some old fish-ponds, some meadows, which, on account of their former occupation, were obliged to be intersected with high banks, upon which stood many trees and a great deal of bush; consequently they were inhabited by many whitethroats: but a pair of cuckoos had also fixed their quarters there, and laid their eggs partly in the nests of Sylvia cinerea, partly in those of S. hortensis. All the cuckoo's eggs were more or less like those of the warbler, by the side of which they lay, only that each cuckoo's egg had upon it several dark spots. The fourth was laid in the nest of S. hortensis, which contained eggs of a peculiar colouring: three of them had a grayish white ground colour, with very few markings; two were uniformly grayish white. The cuckoo's egg which was lying by them was of a grayish white colour, and had only the little spots, like fly marks, observed in the eggs mentioned before. If it should be supposed that the contemplation of the eggs in the chosen nest has an influence on the cuckoo's egg just about to be coloured, it remains still to be investigated how the colouring exists in those eggs which are laid in nests which are covered in above, and are only provided with a little entrance-hole at the side, or those which are laid in the holes of trees, as for instance, of Troglodytes, Phyllopneuste, Ruticilla, &c."

In 'Naumannia' for 1854 is a plate (coloured) of sixteen specimens of cuckoo's eggs, taken from the following nests, and closely resembling the eggs of the nest from which they were respectively taken (p. 415):—

No. 1, from the nest of Sylvia rubecula.
" 2, " Calamoherpe arundinacea.
" 3, " Sylvia hortensis.
" 4, " Ruticilla phœnicurus.
" 5, " Sylvia atricapilla.
" 6, " Calamoherpe palustris.
" 7, " Fringilla Hypolais.
" 8, " Sylvia cinerea.
" 9, " Pratincola rubetra.
" 10, " Motacilla alba.
" 11, " Lanius collurio.
" 12, " Anthus arboreus.
" 13, " Sylvia rubecula.
" 14, " " nisoria.
" 15, " Alauda arvensis.
" 16, " Budytes flava.

E. BALDAMUS.

Birds on Blackheath. By MATTHEW HUTCHINSON, Esq.

May 21, 1867. First noticed the house martins flying about the new houses in the Shooter's Hill Road, nearly one month later than usual.

May 22. Snow storms. May 23. Cold winds. Swallows and martins sweeping the ground, flying fast, evidently a hard matter to get food. During the last four months of 1866 and the first four months of 1867 we had scarcely a dry day, and, if it did not rain daily, the atmosphere was so saturated with moisture that there must have been a great destruction of insect life. In easterly winds no food to be had but about the ponds.

May 31. Swifts, swallows and martins all hawking together over a large, long wheat field on the sunny side of the cemetery hill, the head of the valley from Croydon to Shooter's Hill: possibly the southerly winds sweep up the smaller flies hither, for the Eltham swifts have been hawking there all the summer.

June 1. Saw a butcher bird at the west foot of Shooter's Hill near the cemetery. A quiet, steady bird, he remained motionless a long time; he had but just moulted, and looked bright, clean and smart. Having got a good front view of him I never saw a more delicate beautifully pencilled breast,—a hawk in miniature. From the hedge his flight was straight and heavy. Winding my way up the hill, through the rough tangled bushes, I looked with the glass at a pair of willow wrens near their nest, both darker than on their arrival, less yellow and more olive. Saw a richly coloured male whinchat in his old quarters towards the top of the furzes and brakes. Seeing a lark basking in the sun, and dusting himself in the farm road by Wellhall, I turned the glass on him and saw for the first time the crested lark. The feathers rose perpendicularly from the base of the bill and formed an arch over the top of the head; it gave the bird the appearance of having a top-heavy, cumbersome cock's comb: a cab coming by off it flew, something like a wood lark, and dissimilar to our sky lark. I tried often, but could not meet with it again.

June 2. A pair of swifts located about the many empty new houses in Vanbro' fields, and hawking on the east side of the heath.

June 11. In the fields on the N.W. of Eltham I saw a splendid yellow wagtail perched on an isolated small bush: it was so tame and fearless that I got within six yards of it, and examined it carefully for twenty minutes. It was long, level and slender, like the tree pipit; a white line above the eye, a strong yellow on the breast, with a long brown tail, the outer feathers white: as it flew off to the ploughing it was joined by its mate from a tree. A few weeks later, while following the plough too closely, it was cut down by the whip of a cruel ploughboy, and went to the cat.

June 13. Watched six house martins digging mud from the gravel-pit on the heath. They were busy building in Vanbro' fields, coming and returning incessantly. Never saw so many whinchats, old and young, as during the haymaking the last fortnight in June. The cold wet winds of the early spring had driven them from their accustomed quarters on the hill to seek food and shelter about the close hedges in the neighbourhood.

June 19. Swifts, swallows and martins following the mowers, and catching the insects as they left the cut grass. They skimmed the standing grass next the mowers, and were all flying and hawking alike. I never saw the swifts keep such close company with the swallows and martins.

June 27. Saw a splendid redbacked shrike at a distance through the glass; very light and mealy about the head, black through the eye, a fine red back; a gay beautiful bird, probably the same I saw on the 1st of June, now in mature nuptial plumage. It was hawking after some prey in the long herbs and grass of the ditches. It is in these level fields on the north of the road from Lee to Eltham that I have always met with the redbacked shrike.

June 29. Resting in the outskirts of Eltham and studying the chief characteristics of the flight of the Hirundinidæ, all hawking before me; the better to assist me in distinguishing one from the other I fancied—the swift darts; the swallow swims; the house martin dives; the sand martin flutters. Thus musing I was suddenly assailed by an overpowering, sickening odour I could not account for: on looking around I discovered I was about three hundred yards to the leeward of a bastard spire, "the monument" of draining science, at the east end of Eltham: and as the old Kent spire at the west end points to the regions above, this is connected with the regions below, and brings up through miles of pipes from the very depths of Deptford to pour into the soft delicate air, which so sweetly recommends itself unto Eltham, a foul and pestilent congregation of vapours. Having once been poisoned by this concentrated sulphuretted hydrogen I lost no time in getting to the windward of the abominable essence of drains, and hastened to get a deep draught of the delicious water of Eltham pump, where I hoped I had at last found the cup of Hebe, but, alas! she proves, like the other goddesses, fickle, false, frail. It must be ozone, high above the impurities close to the surface of the earth, that supports the endurance of the birds ever on the wing; they breathe it in its purity, hence their thoroughly oxydized rich blood. I sadly fear this horrid ventilator may again drive my favourite swallows and martins out of Eltham.

July 16. The swift in Vanbro' fields was out hawking over the N.E. corner of the heath. He could scarcely face the strong gale, which so twisted his wings I thought they would have been broken. At last he succeeded in contracting his wings and pointing them downward, like a hay-fork; he then rose higher, spread them out, and sailed right into the wind's eye, as powerful as an old gray gull. The gale was too strong for the swallow and martins.

July 23 and 24. Young swifts out hawking with the old, about Vanbro' fields. I saw no more of them; food was too scarce, so they left directly for a more hospitable clime.

July 25. Seven swifts, some of them young, about Eltham church-yard. The swifts at the east of Eltham had all left. Young swifts could still be heard chirping in the roof of the house in the church-yard.

July 28. Young swallows and martins out in force.

July 31. Six swifts at Eltham.

August 5. Three swifts at Eltham; did not expect to see any.

August 10. Sat in Eltham church-yard and counted nine swifts, old and young. I watched them a long time, thinking as I had seen the first of them I might now see the last. I thought once they had all started on their return, but they came back; it was too misty on the river to see their way.

August 12. But one swift left at Eltham, and it was hawking with the house martins round the church. The other swifts must have left on the previous day. The swifts have generally left by the last day of July, when I have for years seen them congregating on the Sussex coast preparatory to crossing the channel.

August 13. Saw a whole family of whinchats near the top of the hill, each perched on a tall twig. It was an excellent opportunity of noticing the variation in the plumage of old and young, male and female. In passing through the dark shady castle wood a nightjar flew across the path. I saw no other bird of any kind. The single swift was hawking with two house martins about Eltham church. One house martin never left the swift; wherever the swift went there went the house martin: a friendly couple.

August 17. Not a swift to be seen. The Eltham swallows and martins in reduced numbers. I bid farewell to the swifts, the fastest friends I have; and with watching their rapid, graceful, joyous flight, I am so delighted I never tire. Much of the excellent wheat was left standing so long after it was dead ripe that the sparrows attacked it in great numbers. All the sparrows from Deptford, Greenwich and Woolwich appeared to have migrated to the corn-fields: they gave a decided preference to the white wheat: for some yards next the hedges there was scarcely a perfect ear, and they made sad inroads into the whole abundant crop. All the other birds helped them, especially the Conirostres. Whether the starlings lent their aid I could not ascertain. An advocate for a cheap loaf, as the basis of national prosperity, I felt irritated at the lack of zeal in securing the golden crown of the year, the goodness given by God. Much of the mischief done by the birds this summer may fairly be attributed to the farmers. In the debtor and creditor account of the sparrow there is a good balance in its favour. Working my way home in the August evenings, across the fields away from the public paths, I frequently met with small family parties of swallows making straight for the river. This was unusually early, but the young having been reared with difficulty in the scarcity of food, the sooner they left the better.

September 21. Swallows and martins congregating on the house-tops. Numbers of swallows about King John's Eltham palace; most of the old had lost their forks, and the young had not yet got them: thus at a distance they are easily mistaken for martins; the glass shows what they are.

September 30. A large flock of swallows with a few martins resting in the large cow pasture of Kidbrooke farm: a few began to hawk, then up rose the whole lot and disappeared. Crossing a field near Eltham about a dozen swallows shot right over my head in a straight line due south. I never saw swallows fly so swiftly; they were out of sight in a moment. For the last ten days great numbers of the north country swallows have been going south. They linger about the farm-yards for food, and then off again on their long journey. My old friend Dr. Hodgkin, the great anatomist, and the friend of the human race of every colour in every clime, once observed to me that for their preservation God had given the birds a faculty we do not possess. Reflecting on these evidences of unerring wisdom I exclaim "All thy works praise thee."

October 21. Admiring the gorgeous masses of foliage in Eltham Park beautifully variegated with all the rich tints of autumn, I observed a dozen house martins hawking to the southward: these were the last I saw.

Let me recommend the readers of the 'Zoologist' to lay aside their cruel fatal guns, and take to the pocket telescope: they will see more birds, become better acquainted with their forms and flight, and all the detail of their varying plumage; will note with pleasure their peculiar manners and customs as they flit about their happy homes;

and will avoid those obvious mistakes in the birds and their arrival I so frequently meet with. But for these vile guns would not the hoopoe breed commonly with us? It is to be lamented that the beauty and rarity of a bird should be but the premium for its destruction. A dead bird in the hand bears but little resemblance to the pretty, lively, blooming bird in the bush. For stuffed birds I would not give a shilling a dozen.

In the spring of 1867 I saw, within a diameter of two miles, not more than eight miles from London Bridge, above fifty different kinds of birds.

MATTHEW HUTCHINSON.

Blackheath, December, 1867.

Notes on the Folk-lore of Zoology. By EDWARD R. ALSTON, Esq.

(Concluded from Zool. S. S. 1096).

Red Grouse.—There is a tradition in Selkirkshire that before the black grouse became common in that district the red species never ate corn, for

> "The muirhen had sworn by her tough skin
> She sall never eat of the carle's win."

But they have been sadly corrupted by their sable relatives. (See the 'Magazine of Natural History' for 1837, p. 120).

Quail.—Ancient writers relate that ships were sometimes sunk by the vast migratory flocks of quails which settled on them. Yarrell derives the French proverb of "hot as a quail" rather from their heating quality as food than from their animal temperature, but their warm and amorous disposition is perhaps a more natural derivation than either. A local Scotch name for this bird is "weet-my-feet," evidently a paraphrase of its note.

Dotterell.—As is well known this species was credited in old days with great stupidity (hence, says Yarrell, its specific name of *morinellus*, "a little fool"). It is thus alluded to by Drayton in the 'Polyolbion':—

> "The dotterell which we think a very dainty dish,
> Whose taking makes such sport as no man more can wish,
> For as you creep, or cower, or lie, or stoop, or go,
> So, marking you with care, the apeish bird doth so,
> And, acting everything, doth never mark the net
> Till he be in the snare which men for him have set."

Peewit.—The "pease-weep" is sometimes regarded as a bird of evil omen in Scotland, the origin of which is said to be that it frequently betrayed the persecuted Covenanters by its habit of wheeling round and round over an intruder on its haunts. Its nest is constantly "harried," in spite of the poor bird's mournful plaint

"Pease-weet! pease-weet!
Harry my nest and you'll gar me greet!"

That is, make me weep (*Chambers*). "In consequence of the inveteracy excited by the ambitious pretensions of Edward I. to the Scottish crown, an old Scottish Parliament passed an Act ordering all the pease-weep's nests to be demolished, and the eggs broken, assigning as a reason that these birds might not go south and become a delicious repast to our unnatural enemies the English." ('Agricultural Survey of Forfarshire,' quoted by Jamieson).

Heron.—"In Angus it is vulgarly believed that this bird waxes and wanes with the moon, that it is plump when the moon is at the full, and so lean at the change that it can scarcely raise itself, so that it can almost be taken with the hand." (Jamieson, Scot. Dic). It was believed that the legs of the heron contained a perfume which attracted fish within reach of its bill; Isaak Walton says, "And some affirm that any bait anointed with the *marrow* of the thigh-bone of a hern is a great temptation to any fish: these have not been tried by me, but told me by a friend of note that pretended to do me a courtesy;" the receipt would be a difficult one to follow, birds having no marrow in their bones.

Bittern.—The "mire-bumper" or "bog-bummer" was formerly supposed to produce its booming noise by sticking its beak either in a hollow reed or in the mud. Chaucer says

"——— A bittore bumbleth *in the mire.*"

which Dryden changes into

"——— A bittern bumps *within a reed.*"
Wife of Bath.

Stork.—The stork is a bird of good omen, and has no voice unless a loud clattering of its mandibles can be so called; so Spencer proves himself no good naturalist when he says in his 'Epithalamion.'

"Let not the scriech-owl nor the storke be heard."

Dante is more accurate when he compares the gnashing of teeth in the frozen region of hell to this clattering noise of the stork ('Inferno,' xxxii):—

> "These wretched spirits, fixed within the ice
> Tremble, with sound of chattering teeth that seems
> Like the stork's note."

Among the ancients the stork was the emblem of chastity and gratitude, and it is a protected favourite in most lands to this day. I remember once hearing a German clergyman roundly abused by a party of his brethren for having driven the storks from his house; they were the only pair in the neighbourhood, and all agreed that he was "no good Christian" thus to molest them. Many strange stories are told by old writers of this bird; Ælian relates how one which had broken its leg was succoured by a poor widow of Tarentum, and how next season it brought her a huge diamond from foreign lands. Oppian tells us of a pair of storks that were persecuted by a serpent, until they brought a strange bird with them from abroad, who slew the reptile with its sword-like beak, but was poisoned in the conflict and lost all its feathers, when the grateful storks fed and tended their ally till it was recovered. The old birds were said to be carefully fed by their young, whence the Lex Pelargica (from "pelargos," a stork) which inculcated similiar piety in another species. Aldrovandus says that storks will not live in Thuringia because no tithes are paid there, and they were affirmed to confine themselves to free states and republics, which, however, is said by Sir Thomas Browne to be merely, "a pretty conceit to advance the opinion of popular policies."

Curlew.—This bird, with its weird and melancholy note and haunts, has naturally excited superstitious feeling; hence in Scotland its name of "whaup" is also applied to a long-nosed goblin, peculiar, I believe, to that country, and it is to this that Sir Walter Scott alludes, as Yarrell has noted, when he speaks in the 'Black Dwarf' of "worricows and *lang-nebbit things* aboot the land." The note of the curlew heard by night is also dreaded by the Channel fishermen, who term the sound "the Seven Whistlers." Mr. F. T. Buckland, in his 'Curiosities of Natural History' (Second Series, p. 286), quotes an old man at Folkestone who said to him:—"I never thinks any good of them, there's always an accident when they comes. I heard 'em once one dark night last winter. They come over our heads all of a sudden, singing 'ewe, ewe,' and the men in the boat wanted to go back. It came on to rain and blow soon afterwards, and was an awful night, sir; and sure enough before morning a boat was upset and seven poor fellows drowned. I knows what makes the noise, sir; it's them long-billed curlews, *but I never likes to hear 'em.*"

Snipe.—Simrock says that the snipe was sacred to Thor, because its flight was believed to forbode a storm. One of its German names is "donner-ziege" (thunder-goat), and in some parts of France it is called "chevre-volant," because the humming sound which it makes in spring is supposed to resemble the bleating of a goat; hence also one of its Scotch names "heather-bleat."

Bernicle Goose.—The ancient fancy of mediæval naturalists, from which this bird takes its English name, has been already noticed by Mr. Harting (Zool. S. S. 661). There appears, however, to have been some doubt as to the species thus produced; generally it was said to be the "barnicle" or "brant-goose," but Butler says that it was the gannet:—

> "—— From the most refined of saints
> As naturally grow miscreants,
> As barnicles turn *soland geese*
> In th' islands of the Orcades."
>
> *Hudibras.*

Swan.—On the subject of the death-song of the swan, I must again refer the reader to Mr. Harting's notes (Zool. S. S. 663): in Pope's 'Rape of the Lock' also we read

> "Thus on Meander's flowery margin lies
> The expiring swan, and as he sings, he dies."

Great Northern Diver.—Of this bird the Rev. Lucas J. Debes writes, in his 'Description of Foeroe' (Englished by John Storpin, Doctor of Physick, 1671), that it has "two holes, one under each of its wings, capable to hold an egg, wherein they (the natives) suppose it hatcheth its eggs, till the young ones come out, neither is it ever seen with more or less than two young ones, which conceit seems not unreasonable."

Pelican.—The old story of the pelican feeding her young with blood from her own breast has been alluded to by Shakspeare in two or three passages (Hamlet, Act iv., Scene 5: Richard II., Act ii., Scene 1; King Lear, Act iii., Scene 1) which appear to have escaped Mr. Harting's researches. In heraldry the blazon sometimes occurs of "a pelican in her piety."

When these notes were written I was not aware that many of the Scotch rhymes quoted had already been published in the 'Zoologist' by Mr. R. Dick Duncan (Zool. 556). I had originally intended to include also the superstitions regarding reptiles and fishes, but these I must now postpone to some future time. I will therefore conclude with a few additional notes, which were either accidentally omitted or which have since come to my knowledge. In so doing I must return thanks to my kind friends Messrs. Gray, Harting and Norman, for their assistance.

Cat (Zool. S. S. 921).—In many parts of Scotland it was formerly believed that if a cat leaped over a corpse it boded misfortune; some said that the next person it leaped over would be stricken with blindness. Hence cats were carefully excluded from the room where a corpse lay (Jamieson, Scot. Dic.). Every old woman will tell you that cats will "suck a child's breath" and thus kill it, and I would hardly call this an idle superstition, for cats are proverbially fond of warmth, and if they nestled over a young baby's face in its cradle might easily suffocate it.

Wolf (Zool. S. S. 921)—Mr. Harting sends me the following charm, repeated by shepherds to protect their flocks from the wolf:—Come, beast of wool, thou art the lamb of humility! I will protect thee! Go to the right about, grim, gray and greedy beasts, wolves, she-wolves, and young wolves; ye are not to touch the flesh which is here! Get thee behind me, Satan!" Uttering this somewhat incoherent spell was, however, regarded as sorcery, and punished with death.

Black Rat (Zool. S. S. 976).—Mr. Harting has reminded me of a superstition which I accidentally omitted in noticing this species. It was formerly believed that not only could no rats live in the parish of Roseneath, Argyleshire, but that the earth of that district was fatal to the species, and it is said that a West India proprietor actually sent several barrels of earth from Roseneath to Jamaica, in the hope of extirpating the rats there! I am also indebted to Mr. Harting for the following note:—"It was a prevalent notion in past ages that you might extirpate rats by a persevering course of anathematizing in rhyme. Reginald Scott says that the Irish thought they could rhyme any beast to death, but the notion was in general restricted to the rat. It is with reference to this belief or practice, that Rosalind, in 'As You Like It,' says:—'I never was so berhymed since Pythagoras' time, that I was an *Irish rat*, which I can hardly remember.' (Act iii. Scene 2)."

Hare (Zool. S. S. 977).—Mr. Norman writes me:—"In noticing the hare, you omit the curious superstition the Swedes entertain respecting that animal. In Sweden every sportsman cuts off pussy's head immediately after shooting her; there is a fine of so many rigsdalers for taking one home with her head on. The benighted people imagine that should a pregnant woman see the head of a hare her child is sure when born to have a 'hare lip'; hence this fine." I have since learned that another form of this superstition still lingers in some parts of Scotland, where it is believed that if the mother step over a hare's "form" the same effect will be produced.

Boar (Zool. S. S. 979).—In the inside of the fore-leg of a pig, are four small pores; these, say old women in Scotland, are the holes through which the legion of devils entered into the herd of swine which "ran violently down a steep place into the sea and perished in the waters." (Matthew viii. 28—34.)

EDWARD R. ALSTON.

205, Bath Street, Glasgow,
March 4, 1868.

Badger near Wisbech.—On the evening of the 10th of February a fine badger was captured on the farm of Mr. Crow, at Gorefield, near Wisbech: it was first observed on the 6th by Mr. Crow's shepherd. The animal had a burrow in a plantation four feet deep and six feet long: three men dug it out and despatched it. It has been purchased for the Wisbech Museum.—*T. E. Gunn; 21, Regent Street, Norwich.*

Mice and Periwinkles.—A few days since, whilst on a visit to a neighbour who is famous for his choice collection of old-fashioned herbaceous plants, he directed my attention to a piece of rock-work, which was covered with the different varieties, double and single, of the lesser periwinkle (*Vinca minor*). The shoots of these plants were almost all gnawed through close to the ground, whilst in all directions stalks, bitten up into small pieces and chewed all over, bore testimony to wholesale destruction on the part of some small animal. My friend informed me that the rock-work in which the periwinkles grew was the abode of numbers of shrew mice (*Sorex araneus*) and the common short-tailed field mouse or vole (*Arvicola pratensis*). Upon setting a number of traps he caught many of each species, but still the destruction went on, and he was fearful that his plants would be quite destroyed. The quantity of *débris* at the mouth of each hole left no doubt as to the cause of the mischief. The odd part of it is that the mice and the periwinkles have been there for years, but my friend has never had any damage done till the present season.—*H. Harpur Crewe; The Rectory, Drayton-Beauchamp, Tring, March* 6, 1868.

Osprey in Norfolk.—I have lately received information that a pair of ospreys were observed on Rockland Broad, about the middle of February. My informant was out shooting wild fowl, and had just emptied both barrels at some ducks that passed overhead, when an osprey came swooping over him, within easy shooting distance. The bird had been seen several times with its mate around the neighbourhood, but at present, so far as I can ascertain, has fortunately evaded capture.—*T. E. Gunn; March* 3, 1868.

Kestrel feeding on a Slow-worm.—I have just read Mr. Gunn's interesting note on a kestrel eating a frog (S. S. 1131). As he asks if any of the readers of the 'Zoologist' have met with a similar instance, although I must reply in the negative with regard to the frog, the following extract from my 'Birds of Berkshire and Buckinghamshire,' which will very shortly be published, may not be uninteresting:—"Some time since a male kestrel was shot in the act of grasping a slow-worm, which it held so tightly that when it arrived at Cookham, from Reading, its feet still retained their hold, notwithstanding that the victim was alive." The following note touches on the food of the kestrel:—"Mr. Sharpe thinks that this hawk feeds chiefly on small birds: I think mice constitute its principal food, although it has occasionally been seen to carry off live sparrows, redpoles, siskins and goldfinches; and, as a proof of its voracity, a London bird-fancier once exhibited a young kestrel which had been killed and partly devoured by others of its own species." ('Birds of Berkshire and Buckinghamshire,' p. 2.) Perhaps some gentlemen may wonder why this species appears so early as in the second page of my work, so I may as well now state that my arrangements, although following Yarrell's classification, is based on the admirable plan proposed by Mr. Newman, in his Appendix to the 'Letters of Rusticus on Natural History,' and the kestrel is the first bird noticed in my work. My arrangement is as follows:—1. Residents; 2. Summer visitors; 3. Winter visitors; 4. Spring and autumn visitors; and 5. Rare and accidental visitors. No less than 230 species will be included in my list,—a fair number for an inland county,—although doubtless many rare stragglers have escaped my notice.—*Alexander Clark-Kennedy; Eton, Bucks, February* 29, 1868.

An Early Thrush's Nest.—On the 12th of March I discovered a song thrush's nest containing two eggs, in a holly tree in Windsor Home Park. It has been a very mild winter, but still it must be admitted that it is an early date for eggs. Nor was this the only nest I found, for, at the distance of about two hundred yards from the first-mentioned tree, I lighted upon another nest containing three eggs, upon which the female bird was sitting; and as I suppose the eggs were laid at the rate of one a day, I take the date of oviposition of the song thrush for 1868, in Berkshire, to be the 10th of March.—*Id.; March* 13, 1868.

Scarcity of the Redwing.—In the 'Zoologist' for March (S. S. 1131) I perceive a communication from a Devonshire correspondent noticing an unusual scarcity of redwings this winter in the neighbourhood of Barnstaple. I have observed the same scarcity in this district, having only once during the season, and that early in November, seen these birds where they have never, within my recollection, been so few. We generally have, in the park here, several flocks all through the winter and early spring. I am disposed to account for their absence by the fact of severe frost and deep snow having last year caused numbers of redwings to perish.—*Clermont; Ravensdale Park, Newry, March* 17, 1868.

Scarcity of the Redwing.—I can fully corroborate the remarks of Mr. G. F. Mathew on the scarcity of the redwing during the past winter, at least in Bucks and

Herts. It generally swarms, but this season I have scarcely seen one. The fieldfare has also been unusually scarce.—*H. Harpur Crewe.*

Scarcity of the Redwing.—In the last number of the 'Zoologist' Mr. G. F. Mathew remarks on the scarcity of the redwing in Devon this season. I beg to inform him that redwings have been tolerably abundant at Cobham (Kent). Fieldfares, however, have been very scarce, and I never saw more than two or three at a time. Last year fieldfares were very abundant, large numbers appearing on the 3rd of January, the day on which so many wood larks occurred at Cobham and in Sussex. —*Clifton; Eton College, March* 3, 1868.

Wildness of the Hawfinch.—Mr. Doubleday remarks on the extreme wildness of the hawfinch in Epping Forest. As far as I have observed, it is not always very wild. Last winter I observed one hopping about on the grass, within ten paces of the house (Cobham). When seen so near, the white bill of the winter plumage had a very odd appearance, giving one the idea of a bird with a piece of bread in its mouth. I imagine that some hawfinches leave us in the winter and return to breed.—*Id.*

Bittern at Steyning, Sussex.—A fine adult male bittern was shot by Mr. William Stanford on his farm last January: it was shot in the back, and on his going to pick it up it set up its neck-feathers and came at him as well as it could: however, a blow from a hedge-stake soon settled its pugnacity. It has been well set up by Mr. Potter, of the neighbouring village of Bramber.—*H. J. White; Steyning, Sussex, March* 13, 1868.

Blacktailed Godwit in Somersetshire.—On Saturday, the 15th of February, I rescued a very fair specimen of the blacktailed godwit from the cook of a gentleman at Taunton, who had bought it of one of the poulterers with some peewits, and was going to have them all cooked for his dinner. It is an adult bird, in winter plumage. On inquiry at the poulterer's, he said that it had been shot in the marsh, and that the man who shot it told him there was another bird of the same kind in company with it, but that it was too wild for him to get a shot at it.—*Cecil Smith; Lydeard House, Taunton, February* 20, 1868.

Plumage of the Oystercatcher.—In the 'Zoologist' for 1867 (S. S. 607), Mr. Clark-Kennedy describes a specimen of an oystercatcher, which he shot along with another at Hunstanton, in Norfolk. He says that, of the two specimens, "the smaller bird had its neck, to the breast, of a pure glossy black, and its bill was more black at the end than that of the other bird." Does not the first part of this description agree very closely with that given by Sir W. Jardine, in his 'Illustrations of Ornithology,' as being characteristic of the closely-allied species in America, *viz.* Hæmotopus arcticus? I think, however, the bill is yellow both in the American and British birds, not black. It might be worth Mr. Clark-Kennedy's while to compare his specimen with H. arcticus and H. palliatus, both figured by Sir W. Jardine.—*John A. Harvie Brown; 130, George Street, Edinburgh, March* 19, 1868.

Storm Petrel in Buckinghamshire.—During a gale of wind on the night of the 21st of January, at about half-past eleven o'clock, a storm petrel was knocked down by a man as it was flying over the London road, near High Wycombe. It appeared very exhausted, and was taken by its captor to my friend Mr. James Britten, Secretary to the Natural History Society, High Wycombe, who put it into a basket, in which he had placed some flannel, and consigned it to a warm room. The next day it seemed rather better, and appeared to relish a dinner of bread-crumbs soaked in cod-liver oil; then it had a swim in a little tub of fresh water. On the following Friday it was perceptibly weaker, and sank almost directly on being placed in a bath prepared with "Tidman's Sea Salt." On the next day it was again fed with oil and crumbs of bread, and it flew up and down Mr. Britten's drawing-room. On Sunday it was very weak, and on Monday it died, having lived in confinement just a week.—*A. Clark-Kennedy.*

PROCEEDINGS OF SOCIETIES.

ZOOLOGICAL SOCIETY.

February 13, 1868.—JOHN GOULD, V.-P., F.R.S., in the chair.

The Secretary made some observations on a bear in the Society's Gardens, which had been lately received from South America, and which appeared to belong to a new species.

The Secretary exhibited, and made some remarks upon, an egg of the guácharo (*Steatornis caripensis*), which he had received from the Governor of Trinidad.

Mr. Gould exhibited two new species of birds from Australia, and offered some remarks on their affinities. He proposed to name them Chrysococcyx russata and Pitta simillima.

A communication from Surgeon Day was read by the Secretary, in which some new species of Indian fish were described.

A report by Messrs. Sclater and Salvin was read on a collection of birds from Conchitas, Argentine Republic. The collection was formed by Mr. Hudson, and forwarded by him to Prof. Baird, of Washington, who named the specimens.

The Secretary read a second paper from Dr. Hartlaub on the birds of the Pelew Islands, in which he gave some interesting observations and descriptions of two new species.

A new species of dolphin, sent by Mr. Layard from the Cape of Good Hope, was described by Dr. Gray, who proposed to name it Clymene similis.

Mr. Bartlett read an interesting report on the birds which had bred in the Society's Gardens during the past year.*

February 27, 1868.—Dr. J. E. GRAY, V.-P., F.R.S., in the chair.

The Secretary read a letter from Mr. Blandford, one of the scientific corps of the Abyssinian Expedition at Annesley Bay, in which he gave some particulars relating to the Zoology of that district.

Dr. Murie read a paper on the Anthropoid Apes, chiefly with reference to the young, of which he exhibited several specimens.

Dr. Murie also made some remarks upon a rat which had lately been presented to the Society's Gardens by Mr. Bond. It was captured on board a vessel lately arrived from Manilla, and differed so much in general appearance from the common species (*Mus rattus*) as to justify its being considered a new species.

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* Some notes with reference to this report, and a list of the species referred to, will appear in a future number of the 'Zoologist.'

A beautiful specimen of the nocturnal ground parrakeet of Australia (*Geopsittacus occidentalis*) was exhibited by Dr. Murie, who read an interesting paper on its structure.

A report by Messrs. Sclater and Salvin, on a collection of birds sent by Mr. Goering from Venezuela, was read by the Secretary. The collection contained 125 species, three of which were considered as new.

A second report by the same authors was also read, on a collection of birds from Peru. This collection was formed by Mr. Whitely, in the Tambo Valley, south of Arequipa, and contained several species of great interest. Amongst others were specimens of Calidris arenaria, a species which had not previously been observed in South America, and whose geographical range was thus proved to be much more extensive than had been supposed.

Mr. E. T. Higgins exhibited six new species of shells belonging to different genera, and gave descriptions of each.

Dr. Gray gave a description of a new species of monkey, belonging to the genus Colobus, which had been lately forwarded to the British Museum from Zanzibar, where it was discovered by Dr. Kirk. Dr. Gray, in consequence, proposed to name it Colobus Kirki.—*J. E. H.*

ENTOMOLOGICAL SOCIETY.

February 17, 1868.—H. W. BATES, Esq., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Tijdschrift voor Entomologie,' 2nd series, vol. ii. parts 2—6, vol. iii. part 1; presented by the Entomological Society of the Netherlands. 'Remarks on the Names applied to the British Hemiptera-Heteroptera,' by F. P. Pascoe; by the Author.

Election of Members.

Linnæus Cumming, Esq., B.A., and E. P. R. Curzon, Esq., both of Trinity College, Cambridge, were severally ballotted for, and elected Members.

Exhibitions, &c.

Mr. M'Lachlan exhibited a living specimen of Lucanus Cervus, found under ground in an earthen or clayey cocoon: Mr. Backhouse, of Teddington, digging in his garden, had turned up half a dozen of these cocoons, each containing a beetle and the remains of the skin of the larva and pupa. It thus appeared that the beetle had not gone under ground to hybernate, but the larva had descended into the earth and had there undergone the changes to pupa and imago.

Mr. A. E. Eaton remembered one or two such cocoons being dug up in the autumn, about October, in a potato-field, and these contained living stag-beetles.

Mr. Janson also had dug stag-beetles out of earth, not wood; and thought that the specimens appearing in the spring were in fact hatched in the autumn, and remained in their cocoons throughout the winter.

Mr. Stainton compared the case to that of Cossus ligniperda, the larva and pupa of which were specially adapted for their ordinary habitat in wood, but the larva sometimes, he believed in a state of nature, and certainly in confinement, went under ground to change, and formed for itself an earthen cocoon. There was no evidence that the larvæ of the goat-moth, which were not unfrequently found crawling about on the surface of the ground, ever re-entered a tree, and he expected that these underwent their transformations in the earth.

Mr. Janson, on behalf of Mr. A. G. Latham, exhibited two specimens of the nest or cocoon of a sociable larva from Port Natal: a large outer cocoon, three or four inches in diameter, was made up of numerous coats of brown silky matter, the whole forming a covering of considerable toughness, attached to and transpierced by a small branch of a tree; on cutting this open it was found to contain a number of smaller cocoons, each of which was tenanted by a pupa. It seemed as if a score larvæ associated themselves together to construct and build themselves into the outer family cocoon, upon the completion of which each larva proceeded to spin its own individual cocoon.

Mr. Trimen had found the same kind of cocoon in Natal: it was that of Anaphe reticulata (Walker, Brit. Mus. Cat. Lep. Het. part iv. p. 856), one of the family Liparidæ.

Mr. Janson, on behalf of Mr. Latham, also exhibited half-a-dozen larva-cases or cocoons of another Lepidopterous insect, probably a Psyche, or allied thereto. These, too, were from Natal, and were attached to and hung pendulous from the branch of a tree, resembling a cluster of large beech-nuts.

Mr. Trimen said that these cases were common in Natal on the Mimosa, or thorny acacia; he had collected many of them, but had never been able to breed a single moth of either sex.

Mr. Pascoe exhibited a beetle from New Zealand (probably from Otago), which he regarded as the type of a new genus of Cucujidæ, and which he proposed to describe under the name of Dryocora Howittii. He remarked that members of some of the clavicorn families were well known to have tarsi with varying numbers of joints; or, when the normal number were present, the basal joint was very small or almost obsolete, as in many Cucujidæ, or the penultimate was very small or almost obsolete, as in the Nitidulidæ. In Cucujus the tarsi were heteromerous in the male and pentamerous in the female; but in Dryocora, which in other respects was allied to Cucujus, the tarsi were tetramerous in both sexes, the basal joint being suppressed. Organic modifications of this kind, and the exaggerations of form of some one organ which in certain groups was found to be subject to unusual modification,—as the antennæ in Paussidæ, the eyes of Hippopsinæ, the pronota of Membracidæ, &c.,—seemed to Mr. Pascoe "to point to a law of aberration only to be explained on the hypothesis of the derivative origin of species."

The President mentioned that Mr. Darwin was engaged in elaborating the subject of secondary sexual differences and sexual selection, and would be obliged by the communication of detailed observations on the numerical proportion of the sexes of insects in nature. He had numerous cases of well-authenticated numerical excess of the male over the female, and was desirous to ascertain whether in other cases a corresponding excess of the female over the male had been noticed.

Mr. M'Lachlan mentioned Apatania muliebris, of which he had captured hundreds, but the male had never been seen; and Boreus hiemalis, of which only three or four males had been known to occur in this country. Mr. Janson mentioned Tomicus villosus, the female of which was almost a plague, whilst the male was hardly known.

Mr. S. Stevens referred to Drilus flavescens, the second known British female of which was exhibited at the previous Meeting (Zool. S. S. 1137). Mr. F. Smith cited Tenthredo cingulatus, the male of which was rare, whilst the female abounded, and Hemichroa Alni, of which the male was quite unknown. Of the latter Mr. Smith had a large number of cocoons, and if there were such a thing as a male of that species he hoped soon to breed it.

The President remarked that the different habits of the sexes must be taken into account. Among the South-American butterflies, the males of many were more handsome than the females, and exceeded them in number in the proportion of a hundred to one; the male sported in the sunshine, whilst the female was slow in flight, never appeared in the open sun, but remained in the shade of the forest: under such circumstances it might be that a superabundance of males was necessary in order to ensure the impregnation of the females and to prevent the extinction of the species; but he was unable to suggest any explanation of an excess of females over males.

Mr. Stainton thought that, by reason of the difference of habit of the sexes, little reliance could be placed upon records of a supposed disproportion of the number of the sexes of any insect when in a state of nature: it was only by breeding the insect that the relative numbers of the sexes could be ascertained with any certainty. In Micro-Lepidoptera he had often found the result of observations in the field at variance with the result of breeding the same species in confinement; species the females of which, from their retiring and secluded habits, were seldom caught, whilst the males were common, had, when eggs or larvæ were obtained, produced twice as many females as males.

Mr. M'Lachlan said that Mr. Darwin had recently put two queries to him, Do male dragon-flies fight with one another? and, Do many or several males follow one female? He confessed his inability to answer with certainty either of these apparently simple questions.

Papers read.

The following papers were read:—

"A few Observations on the Synonymy of Tinea (?) alpicella and Zelleria Saxifragæ, n. sp.," by Mr. H. T. Stainton.

"On the Homologies of the Ovipositor," by Mr. A. E. Eaton.

"Contributions to a Knowledge of the Coleoptera," Part 1 (continued); by Mr. F. P. Pascoe.

March 2, 1868.—H. W. BATES, Esq., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:— 'The Journal of the Linnean Society,' Zoology, No. 39; presented by the Society. Newman's 'British Moths,' No. 15, and 'The Insect-Hunter's Year-Book for 1867;' by the Author. 'The Zoologist' for March; by the Editor. 'The Entomologist's Monthly Magazine' for March; by the Editors.

Election of Members.

G. A. Lebour, Esq., of the Geological Survey Office, and Captain A. F. Lendy, of Sunbury, were severally ballotted for, and elected Members.

Exhibitions, &c.

Mr. Edward Saunders exhibited various species of Buprestidæ which he had compared with the Fabrician type-specimens in the collection of Sir Joseph Banks, with a view to the correction of several errors of nomenclature. Thus the insects known as Psiloptera morbillosa, Dicerca lurida and Belionota canaliculata were not the true morbillosa, lurida and canaliculata of Fabricius: the species commonly called Ancylocheira flavomaculata, *Fabr.*, was in fact the maculata of Fabricius, whilst the maculata of authors other than Fabricius was identical with the strigosa of Gebler. Mr. E. Saunders also exhibited Pasiphae modesta and Ethon cruciatum, which, though described by Fabricius, and figured by Olivier and Herbst, had not been noticed by recent authors, except that Gory had described, under the name of Buprestis superba, an insect which was not specifically distinct from P. modesta.

Mr. Pascoe exhibited the type of a new genus of Prionidæ, captured by Mr. Swanzy; and read the following description:—

"EUDIANODES (*Colpodero* aff.).—Clypeus distinctus. Prothorax marginibus angustatis, serratis. Mesosternum latum. Tibiæ simplices, compressæ; tarsi breves, articulo ultimo cæteris fere æquali. Corpus haud validum.

Eudianodes Swanzii.—Niger nitidus; capite prothoraceque subtiliter punctatis, hoc macula magna fere tripartita fulva ornato; elytris subtilissime punctatis. Long. 11 lin. Hab. Cape Coast Castle."

Mr. Pascoe also read the following description of a new species of Curculionidæ:—

"*Oxycorynus Hydnoræ.*—Rufo-fuscus; rostro attenuato; fronte prothoraceque creberrime punctatis; elytris 6-carinatis, interstitiis granulatis. Long. 6 lin. (rostro incl.). Hab. Catamarca."

This Oxycorynus formed part of the contents of a small box sent from South America by Mr. F. Schickendantz, of Pilciao (Zool. S. S. 1102). The other insects in the box were a Xylopertha, resembling X. sinuata, but smaller; two species of Nitidulidæ, apparently near Carpophilus; and a Saprinus, with a large yellow spot on each elytron. The whole of these were stated by Mr. Shickendantz to have been found by him "in the flowers of a new species of Hydnora" (a genus of Cytinaceæ, root-parasites, some of which exhale a peculiar animal odour).

Mr. T. W. Wood (who was present as a visitor) exhibited pupæ of several Lepidoptera from Sierra Leone, one of which, apparently an Antheræa, was remarkable from having two very deep impressions near the hinder extremity. Mr. Wood mentioned that he had once opened a pupa of Sphinx Ligustri, and found that the haustellum was 2½ times as long as its case, within which it lay double throughout the entire length of the case and in a triple fold for half its length.

With reference to the numerical disproportion of the sexes of insects (S. S. 1181), Mr. Stainton mentioned that since the previous Meeting he had inquired the results of the experience of Mr. Doubleday and Mr. Hellins in breeding Micro-Lepidoptera. Mr. Doubleday thought that males were generally more numerous than females, and did not remember a single instance in which he had met with an excess of females. Mr. Hellins, on the other hand, reported that he had usually found females more numerous than males.

Mr. Stainton added that Mr. Darwin would be glad to receive replies to the following further inquiries: —(1), whether sexual attraction or fascination was exercised in the same manner by butterflies which have the wings gaily ornamented on the under side and by those which have dark under sides, as *e.g.* by Argynnis and Vanessa; (2), whether any and what moths were more brightly coloured in the male than in the female sex; and (3), whether any and what moths were more conspicuously coloured on the under side than on the upper side of the wings. (In reply to the third query, Mr. Wormald mentioned the genus Hypopyra). Mr. Darwin was also desirous of acquiring facts bearing on the distinction between sexual and protective colouring in insects; and of ascertaining the causes which decided the success of one out of several males which were in pursuit of the same female.

March 16, 1868.—H. W. BATES, Esq., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Stettiner Entomologische Zeitung,' 1868, Nos. 1—3; presented by the Entom. Verein zu Stettin. 'Coleopterologische Hefte,' II.; by the Editor, Baron Edgar von Harold. 'Monographie der Scydmæniden Central- und Süd-Amerika's;' by the Author, Dr. L. W. Schaufuss.

Election of Member.

Charles Carrington, Esq., of Westwood Park, Forest Hill, was ballotted for, and elected a Member.

Exhibitions, &c.

Mr. F. Smith exhibited a specimen of the larva of a Lepidopterous insect from Brazil, which was described by Mr. Peckolt, of Cantagallo, as being of a social habit, and forming a common cocoon as large as a man's head, within which each individual formed its own proper cocoon. The larva was covered with spines, like a Vanessa or Acræa; and appeared to belong to one of the Diurni rather than to one of the Bombyces.

Mr. Stainton directed attention to the account given by Herr Hartmann, in Stett. Ent. Zeit. 1868, p. 109, of the breeding of Sesia cephiformis, Grapholitha duplicana, *Zett.* (interruptana, *H.-S.*), and Gelechia electella, from gall-like swellings on the twigs of juniper bushes: an examination of the juniper during the spring would probably lead to the discovery in this country of the larvæ of the two last-mentioned species.

The President announced the proximate publication, by Dr. Gemminger and Baron E. von Harold, of the first part of a General Catalogue of Coleoptera, intended to include all the hitherto-described species of the whole world: the classification would be based on that of Lacordaire, the species of each genus being arranged in alphabetical order.

Mr. F. Smith read a paper on ants, extracted from 'The Guardian' of 1713, and, as the result of an elaborate and amusing criticism thereof, contended that the history of the habits of those insects therein contained, detailed and circumstantial though it were, could not be a record of actual observations, but was chiefly, if not entirely, the offspring of the imagination of the writer.—*J. W. D.*

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TO CORRESPONDENTS.

Communications unavoidably stand over signed J. H. Gurney, F. R. Archer Briggs, Thomas Cornish, W. Jeffery, jun., E. C. Moor, Albert Müller, John Cordeaux, Harry Blake-Knox, A. Clark-Kennedy, T. E. Gunn, Edward Sweetapple and Henry P. Hensman.

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